This listing of claims will replace all prior versions and listings of claim in the application:

Listing of the Claims:

1. (original) A method for evaluating characteristics of thin film layers of a patterned semiconductor wafer comprising the steps of:

generating a probe beam of X-rays;

directing said probe beam onto the surface of said patterned wafer such that the spot size of said probe beam is large relative to the feature size of the pattern on said surface of said patterned wafer;

measuring the intensity of various X-rays as reflected from said patterned wafer to generate reflectivity data; and

analyzing said reflectivity data to determine characteristics of said thin film layers.

2. (original) A method as recited in claim 1 wherein said characteristics include thin film layer thicknesses.

3. (original) A method as recited in claim 1 wherein said measuring step includes using a charge coupled device.

4. (original) A method as recited in claim 1 wherein said measuring step includes using a self-scanning diode array.

5. (original) A method as recited in claim 1 wherein said measuring step includes using a multiple-wire proportional counter.

6. (original) A method as recited in claim 1 wherein said measuring step includes using a multiple-anode microchannel detector.

7. (currently amended) A method as recited in claim 1 wherein said directing step includes focusing and reflecting said X-rays using a curved ~~monochromator~~ monochrometer.

8. (original) A method as recited in claim 1 wherein said analyzing said reflectivity data step includes applying a Fourier transform.

9. (original) A method as recited in claim 1 wherein said analyzing said reflectivity data step includes applying a transform function to said reflectivity data, and further wherein said transform function is chosen based on a comparison of said reflectivity data with X-ray reflectivity data corresponding to measurements made on an unpatterned region of a semiconductor wafer.

10. (original) A method as recited in claim 1 wherein said reflectivity data include data measuring reflected X-ray intensity as a function of angle of incidence.

11. (original) A method for evaluating characteristics of thin film layers of a patterned semiconductor wafer comprising the steps of:

generating a probe beam of X-rays;

focusing said probe beam on the surface of said patterned wafer such that various X-rays within the focused probe beam create a range of angles of incidence with respect to said surface and such that the spot size of said probe beam is large relative to the feature size of the pattern on said surface of said patterned wafer;

measuring the intensity of various X-rays as a function of position within the probe beam as reflected with the positions of the X-rays within said reflected probe beam corresponding to specific angles of incidence with respect to said surface, thereby generating reflectivity data; and

analyzing said reflectivity data to determine characteristics of said thin film layers.

12. (original) A method as recited in claim 11 wherein said characteristics include thin film layer thicknesses.

13. (original) A method as recited in claim 11 wherein said measuring step includes using a charge coupled device.

14. (original) A method as recited in claim 11 wherein said measuring step includes using a self-scanning diode array.

15. (original) A method as recited in claim 11 wherein said measuring step includes using a multiple-wire proportional counter.

16. (original) A method as recited in claim 11 wherein said measuring step includes using a multiple-anode microchannel detector.

17. (currently amended) A method as recited in claim 11 wherein said focusing step includes using a curved ~~monochromator~~ monochrometer.

18. (original) A method as recited in claim 11 wherein said analyzing said reflectivity data step includes applying a Fourier transform.

19. (original) A method as recited in claim 11 wherein said analyzing said reflectivity data step includes applying a transform function to said reflectivity data, and further wherein said transform function is chosen based on a comparison of said reflectivity data with X-ray reflectivity data corresponding to measurements made on an unpatterned region of a semiconductor wafer.

20. (original) A method for evaluating characteristics of thin film layers of a patterned semiconductor wafer comprising the steps of:

generating a probe beam of X-rays having a broad spectrum of energies;

directing said probe beam onto the surface of said patterned wafer such that the spot size of said probe beam is large relative to the feature size of the pattern on said surface of said patterned wafer;

measuring the intensity of various X-rays as reflected from said patterned wafer to generate reflectivity data measuring reflected X-ray intensity as a function of X-ray energy; and

analyzing said reflectivity data to determine characteristics of said thin film layers.

21. (original) A method as recited in claim 20 wherein said characteristics include thin film layer thicknesses.

22. (original) A method as recited in claim 20 wherein said measuring step includes using a charge coupled device.

23. (original) A method as recited in claim 20 wherein said measuring step includes using a self-scanning diode array.

24. (original) A method as recited in claim 20 wherein said measuring step includes using a multiple-wire proportional counter.

25. (original) A method as recited in claim 20 wherein said measuring step includes using a multiple-anode microchannel detector.

26. (original) A method as recited in claim 20 wherein said generating step includes using a X-ray source that emits Bremsstrahlung radiation.

27. (original) A method as recited in claim 20 wherein said analyzing said reflectivity data step includes applying a Fourier transform.

28. (original) A method as recited in claim 20 wherein said analyzing said reflectivity data step includes applying a transform function to said reflectivity data, and further wherein said transform function is chosen based on a comparison of said reflectivity data with X-

ray reflectivity data corresponding to measurements made on an unpatterned region of a semiconductor wafer.

Claims 29-31. (cancelled)